

# The Internet as a Resource for Physics

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## I. Objectives

To explore the Internet as a resource for physics research and education. Today's work will focus on the use of an Internet browser (Netscape), will show you where to find a useful book on-line, and will give you the opportunity to explore physics related sites on the Internet.

## II. Introduction

A **network** is a collection of individual computers that share information. The **Internet** is an affiliation of tens of thousands of private, commercial, academic, and government supported networks in more than 80 countries. With the Internet, one can locate many items useful for physics research and education: current research information, reference documents, and software. On the other hand, there is also much on the Internet that is absolutely worthless.

There are several useful aspects of the Internet that we have already used. These are:

- **Newsgroups:** a forum where people with common interests may share information
- **File Transfer Protocol (ftp):** an Internet application that allows one to transfer files from a remote computer to your own computer
- **Telnet:** an Internet application that lets one connect to remote computers and run programs or browse through information.

Today we will explore two new parts of the Internet, defined below:

- **Gopher:** an Internet system that allows one to locate and retrieve files and documents
- **World Wide Web (WWW):** an Internet-based system that allows one to jump from one document to another, from one computer to another, simply by clicking icons and highlighted text called **hypertext**. Hypertext points to

other related information using addresses called **uniform resource locators (URL)**.

A **browser** is a program that allows you to locate information and go to sites on the Internet. We will use a browser called **Netscape**.

### III. Exercises

#### A. Getting Started with Netscape

Objective:	to gain experience in using Netscape
Where to begin:	start in MS Windows and double-click on the Netscape icon
What to do:	use Netscape to perform the operations below
What to turn in to your instructor:	nothing
What to put in log book:	the time you begin your work, problems, solutions, new commands, etc.

(1) **Going to a known site:** use the **File** menu and the **Open Location** button, then specify one of the following URLs to go to a specific site:

<b>Uniform Resource Locator (URL)</b>	<b>What's there</b>
<a href="http://www.amherst.edu/~ajp/">http://www.amherst.edu/~ajp/</a>	American Journal of Physics Homepage
<a href="http://www.nrel.gov/">http://www.nrel.gov/</a>	Renewable Energy Lab Information
<a href="http://www.public.iastate.edu/~physics/">http://www.public.iastate.edu/~physics/</a>	ISU Physics Homepage

(2) **Searching for an unknown site:** use the **Net Search** button and the appropriate search words to locate an item. For example, locate Parks Library's Scholar system by searching relevant key words. Once you find Scholar, connect to the on-line catalog (ICAT) and check to see if either of your instructors has published anything Park's Library deemed worth saving.

(3) **Viewing what you have done:** view a list of all the places you have visited on the web so far by clicking the menu **Go** and the submenu **View History**. You should see a list of sites you have been through in this session. Click the **OK** button to quit.

(4) **Saving the location of a site:** save the location of ICAT for later use by going to the menu **Bookmark** and clicking **Add Bookmark**. Once an address is added to the list of bookmarks, one may access it immediately by entering the **Bookmark** menu and clicking the title of the desired bookmark. Check this to make sure it works.

(5) **Moving forward and backward:** click the button **Back** and note that it takes you to your previously visited web site. Pushing the **Forward** button then returns you to your starting point.

(6) **Other Buttons:** explore buttons you are not familiar with and make note of what they do and where they take you.

(7) **Other search programs:** explore the various search programs available such as **Yahoo, Lycos, Webcrawler, etc.** These all do what the **Net Search** button on Netscape does, but they each search in a different way. These search routines may found on the ISU homepage.

### **B. Reading Numerical Recipes**

Objective:	to read section 4.1 of <i>Numerical Recipes</i> (this section is about numerical integration, and we will use it next week)
Where to begin:	in Netscape
What to do:	search the web for the book and then read section 4.1 and print out the first 3 pages
What to turn in to your instructor:	nothing
What to put in log book:	the time you begin your work, problems, solutions, new commands, etc.

(1) *Numerical Recipes* is a beautifully written book that covers all aspects of computational methods of interest to us in this course, and more. It cost me \$45 five years ago, but you can access it for free through the Internet. First search for the book by title (*Numerical Recipes in FORTRAN*). This will probably lead you to the **Numerical Recipes Homepage**, after which you should click on **Books On-line** and then look around until you find the **On-Line in Adobe Acrobat** heading.

(2) Read Section 4.1 on techniques of numerical integration. To do this, click on the icon by the section number. A program called **Adobe Acrobat** should begin, and after a few seconds (if you are lucky) you will see the text.

(3) Print out the first three pages (please do not print out all eight pages). Do this just as you would in MS Word (ask if you need help).

*Note: this exercise is our best example of useful information on the Internet. The viewing software Adobe Acrobat is public domain, and was down-loaded from the web by your instructors and installed on your machines. We would have liked to let you do this yourself, but to save time we did it for you.*

**C. Physics Resources**

Objective:	help us put together a list of sites useful for physics research and education
Where to begin:	in Netscape
What to do:	search the web for books, software, and information you would consider useful for physics and for this course
What to turn in to your instructor:	a 1-2 page, single-spaced report, written with a partner, summarizing your findings and your overall opinion of the Internet
What to put in log book:	anything useful you find

(1) Find a partner. Together you and your partner should put together a list containing URLs, an explanation of where they take you, and why you think these sites are valuable. For example, you might search for:

- information related to future topics we will study in this course (**MS Excel, Maple, LabVIEW**). Is there any free software available?
- information related to an area of physics you are interested in (**Condensed Matter Physics, High Energy Physics, etc.**)
- Search the names of a few national laboratories as **Argonne, Ames Lab, Brookhaven, Lawrence Livermore, etc.** and explore the information they offer. Take good notes on what you find to be useful.

(2) Write a 1-2 page report, single-spaced, with the help of your partner. Include the URLs for at least five Internet sites where you found information useful for physics research or education. Write your report in MS Word, call it **report1.doc**, and save it on your diskette in the **A:\** drive (ask if you have questions about this). Note that you may run Netscape and Word simultaneously, and that you may switch back and forth between them by simultaneously pressing the **ALT** and **TAB** keys.

**D. Check the Physics 232 Locker**

If you have not already done so, check to see that you have been given access to the Physics 232 locker on Vincent. The instructions for this were posted in the Physics 232 newsgroup on Monday, which you may read through Netscape. Follow the instructions there, and inform your instructors if you cannot access the locker.

**E. Log books and note cards**

If you have any time left over, work on your log books and note cards. For this course, we will ask that you try to record anywhere from 5 to 10 log book entries and 3 to 5 note card entries per lab period. Follow the format outlined in the syllabus. We hope that these materials will be of value to you after you finish this course.